



NVLAP LAB CODE 201011-0

Report No.: STD1602034NB-B

LM-79-08 Test Report

For

CEA GROUP INTERNATIONAL CO.,LTD

(Brand Name: CEA/EAEC)

Sanjiali Industrial Zone Zhucheng Road Panshi North baixiang Yueqing Zhejiang China

Architectural Flood and Spot Luminaires and Industrial buildings

Model name(s): CSFL-30X

Remark: The letter 'X' in the model name stand for different mounting arm. It could be blank, stand for large u-shaped iron. It could be "A", stand for rocker arm.

Representative (Tested) Model: CSFL-30(2700K)
CSFL-30(5700K)

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Peeta Cao

Engineer: Peeta Cao

Date: Mar.10,2016

Review By:

Tommy Liang

Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-C/2

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

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Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
CSFL-30	2700K	2670.7	29.97	89.10
CSFL-30	3000K	2698* ¹	30.11* ²	89.63* ³
CSFL-30	3500K	2726* ¹	30.11* ²	90.53* ³
CSFL-30	4000K	2754* ¹	30.11* ²	91.46* ³
CSFL-30	4500K	2782* ¹	30.11* ²	92.39* ³
CSFL-30	5000K	2810* ¹	30.11* ²	93.32* ³
CSFL-30	5700K	2836	30.25	93.75

*1: This value is calculated and the calculation formula is as below:

$$2698 = (2836 - 2670.7) / 6 + 2670.7$$

$$2726 = (2836 - 2670.7) / 6 + 2698$$

$$2754 = (2836 - 2670.7) / 6 + 2726$$

$$2782 = (2836 - 2670.7) / 6 + 2754$$

$$2810 = (2836 - 2670.7) / 6 + 2782$$

*2: This value is calculated and the calculation formula is as below:

$$30.11 = (30.25 + 29.97) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$89.63 = 2698 / 30.11$$

$$90.53 = 2726 / 30.11$$

$$91.46 = 2754 / 30.11$$

$$92.39 = 2782 / 30.11$$

$$93.32 = 2810 / 30.11$$



U.S. Department of Energy

Lighting Facts™ Uniform LM-79 Reporting Template

Laboratory Information:

Name of Test Laboratory	Standard-Tech Co., Ltd.
Date of Test Report	Mar.10,2016
Test Report No.	STD1602034NB-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA/EAEC	
Model Number	CSFL-30(2700K)	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Architectural Flood and Spot Luminaires and Industrial buildings	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Integrating Sphere

Goniophotometer

Electrical Measurements:

Output

Output

Input Wattage	--	29.97	W
Input Current	--	0.2542	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9826	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	2670.7	lm
Initial Lumen Efficacy	--	89.10	lm/w
Correlated color temperature / CCT	2748		K
Color rendering index / CRI	80.2		
R9 Value	0		
Duv	-0.0026		

Luminous Intensity Distribution

Center beam candlepower (if applicable)	-----	1091	cd
Beam angle (if applicable)		104.6	°
Zonal lumens in the 0 °-60 ° zone		89.1	%
Zonal lumens in the 60 °-90 ° zone		10.9	%
Zonal lumens in the 90 °-120 ° zone		0	%
Zonal lumens in the 120 °-180 ° zone		0.1	%

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Laboratory Information:

Name of Test Laboratory	Standard-Tech Co., Ltd.
Date of Test Report	Mar.10,2016
Test Report No.	STD1602034NB-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA/EAEC	
Model Number	CSFL-30(5700K)	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Architectural Flood and Spot Luminaires and Industrial buildings	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Integrating Sphere

Goniophotometer

Electrical Measurements:

Output

Output

Input Wattage	30.25	--	W
Input Current	0.2551	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9883	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	2836	--	lm
Initial Lumen Efficacy	93.75	--	lm/w
Correlated color temperature / CCT	5457	--	K
Color rendering index / CRI	85.3	--	
R9 Value	15	--	
Duv	0.0024	--	

Luminous Intensity Distribution

Center beam candlepower (if applicable)	-----	cd
Beam angle (if applicable)		°
Zonal lumens in the 0 °-60 ° zone		%
Zonal lumens in the 60 °-90 ° zone		%
Zonal lumens in the 90 °-120 ° zone		%
Zonal lumens in the 120 °-180 ° zone		%

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Test Specifications:	
Date of Receipt	:Dec.17,2015
Date of Test	:Dec.19,2015
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

Test Methods

1. Photometric and Electrical measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 ° vertical intervals and 22.5 ° horizontal intervals.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

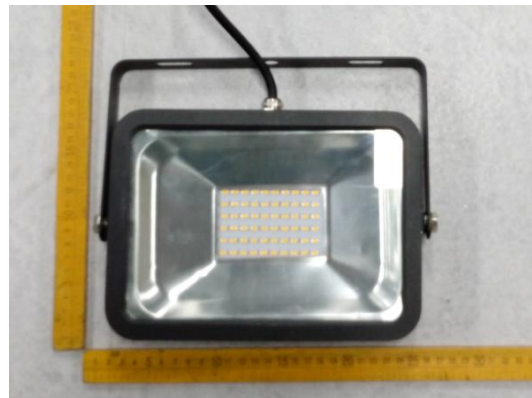
Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

1. Product Information:

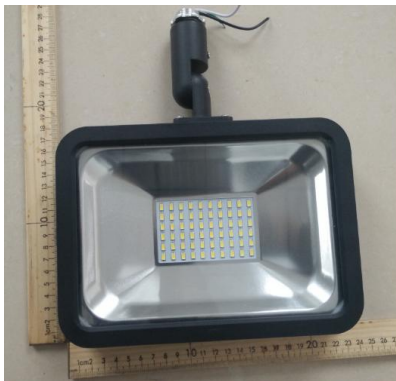
Brand Name	CEA/EAEC
Model Number	CSFL-30X
Luminaire Type	Architectural Flood and Spot Luminaires and Industrial buildings
Rated Voltage / Frequency	100~ 277Vac, 50/60Hz
Nominal Power	30W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,3500K,4000K,4500K,5000K,5700K
LED Manufacturer	Chuang Te LED
LED Model	CT-5730
Sample Receipt Date	Dec.17,2015
Sample Number	STD1602034NB-B1(2700K),B2(5700K)

Photo

CSFL-30



CSFL-30A



2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-12-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CSFL-30(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	0.2542	29.97	0.9826	10.58
4NB-B1	277.0	60	0.1227	30.84	0.9073	13.09

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	80.2
R9	0
CCT (K)	2748
Chromaticity (x, y)	x=0.4517 y=0.4019
Chromaticity (u', v')	u'=0.2611 v'=-0.5227
Duv	-0.0026

Special Color Rendering Indices			
R1	80	R9	0
R2	93	R10	86
R3	91	R11	75
R4	76	R12	77
R5	80	R13	83
R6	93	R14	95
R7	77	R15	71
R8	51	--	--

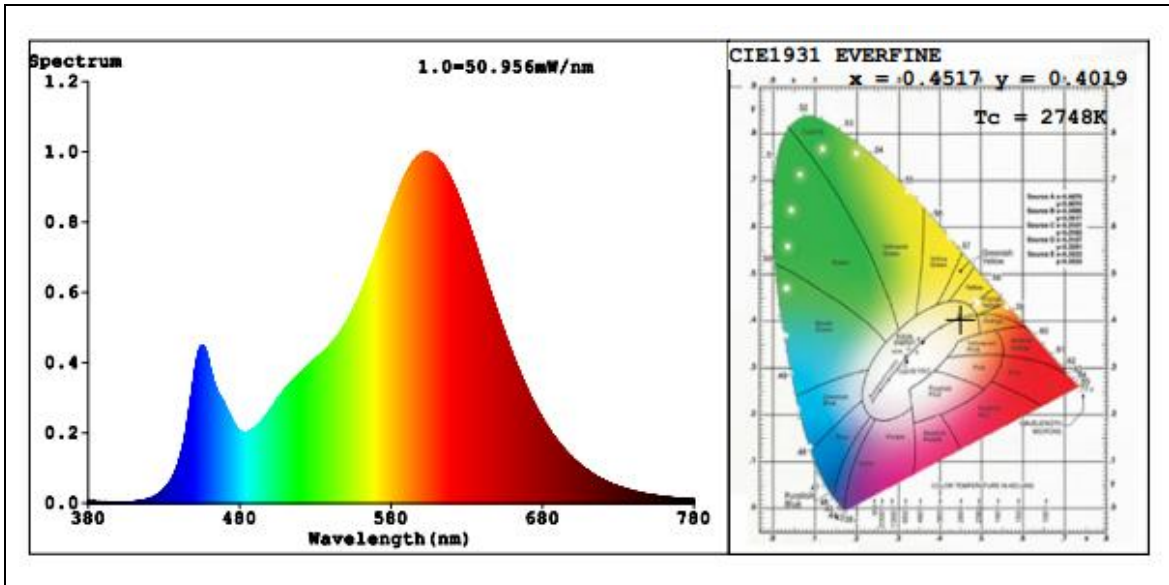
Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	2670.7
Luminous Efficacy (lm/W)	89.10
Beam Angle °	104.6
Center Beam Candle Power (cd)	1091

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	2653.5
Luminous Efficacy (lm/W)	86.05

Spectral Power Distribution & Chromaticity Diagram



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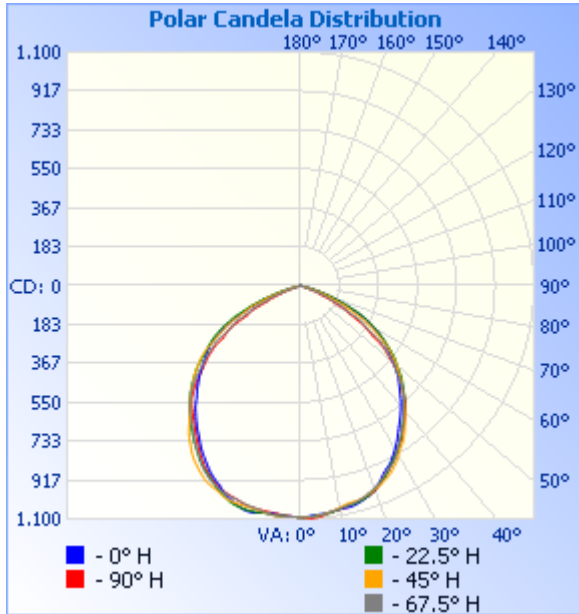
<http://www.standard-tech.com>

Zonal Lumen Tabulation

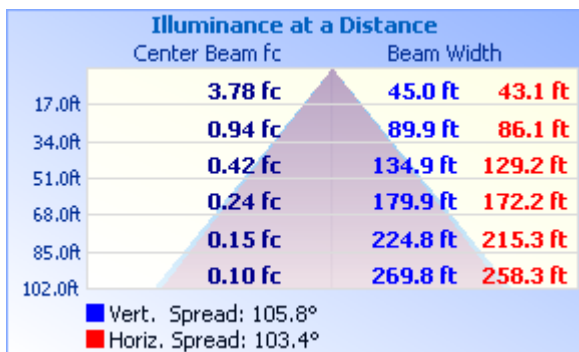
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	857.9	32.1%
0-40	1,393.2	52.2%
0-60	2,378.6	89.1%
60-90	290.4	10.9%
70-100	41.8	1.6%
90-120	0.0	0%
0-90	2,669.0	99.9%
90-180	1.4	0.1%
0-180	2,670.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	103.2	3.9%	90-100	0.0	0%
10-20	299.5	11.2%	100-110	0.0	0%
20-30	455.2	17.0%	110-120	0.0	0%
30-40	535.3	20.0%	120-130	0.1	0%
40-50	537.8	20.1%	130-140	0.3	0%
50-60	447.5	16.8%	140-150	0.3	0%
60-70	248.6	9.3%	150-160	0.3	0%
70-80	40.7	1.5%	160-170	0.2	0%
80-90	1.1	0.0%	170-180	0.1	0%

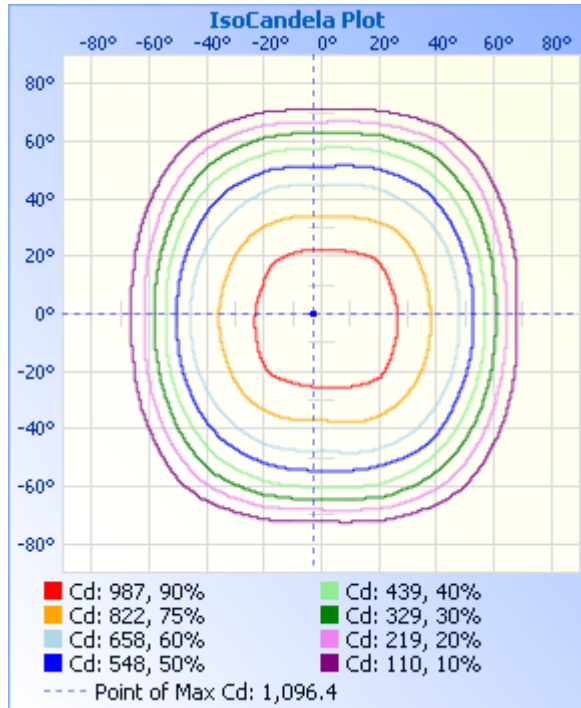
Photometric Data



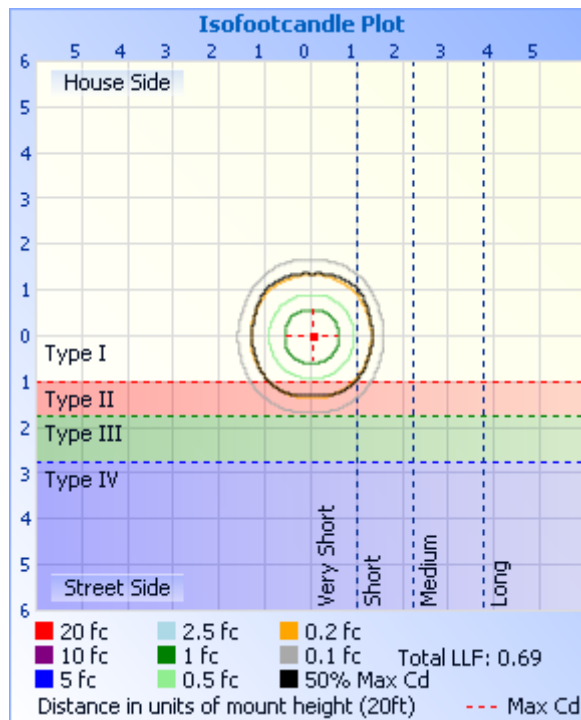
Illuminance Plots



ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	1091	1091	1091	1091	1091	1091	1091	1091	1091	1091	1091	1091	1091	1091	1091	1091	1091
1	1090	1091	1092	1092	1094	1090	1092	1091	1090	1090	1090	1090	1089	1090	1090	1091	1090
2	1088	1090	1092	1092	1096	1089	1091	1090	1089	1090	1089	1090	1089	1088	1088	1089	1088
3	1085	1089	1090	1091	1096	1088	1090	1088	1088	1089	1089	1090	1088	1086	1087	1087	1085
4	1083	1087	1088	1088	1094	1086	1088	1088	1087	1090	1090	1090	1085	1084	1086	1085	1083
5	1081	1085	1085	1085	1091	1085	1086	1087	1086	1089	1092	1090	1082	1083	1085	1083	1081
6	1079	1083	1082	1082	1086	1082	1083	1084	1084	1087	1091	1090	1081	1081	1082	1081	1079
7	1077	1081	1078	1078	1080	1077	1079	1082	1083	1086	1089	1088	1079	1080	1079	1078	1077
8	1074	1077	1073	1074	1075	1071	1075	1082	1083	1085	1085	1085	1077	1076	1076	1075	1074
9	1072	1073	1067	1071	1072	1068	1072	1084	1084	1085	1081	1080	1075	1072	1074	1073	1072
10	1069	1068	1062	1067	1071	1067	1069	1086	1088	1086	1078	1075	1074	1067	1069	1071	1069
11	1068	1062	1056	1063	1068	1067	1067	1087	1091	1087	1076	1071	1073	1064	1063	1070	1068
12	1069	1059	1051	1060	1065	1067	1067	1087	1093	1088	1074	1069	1071	1062	1056	1070	1069
13	1068	1060	1049	1058	1060	1066	1067	1087	1093	1087	1072	1066	1068	1061	1052	1069	1068
14	1064	1058	1049	1054	1055	1062	1067	1085	1090	1086	1071	1063	1065	1059	1049	1065	1064
15	1059	1055	1047	1050	1050	1056	1064	1082	1085	1084	1071	1059	1060	1056	1047	1061	1059
16	1054	1050	1045	1044	1047	1049	1061	1075	1077	1081	1069	1054	1055	1050	1047	1057	1054
17	1047	1045	1040	1037	1044	1044	1059	1068	1070	1078	1069	1051	1050	1044	1045	1052	1047
18	1040	1038	1033	1030	1040	1040	1057	1060	1061	1072	1067	1048	1046	1040	1042	1046	1040
19	1032	1032	1027	1024	1035	1035	1054	1052	1051	1064	1064	1045	1041	1035	1039	1039	1032
20	1022	1024	1021	1016	1027	1029	1047	1044	1043	1055	1058	1041	1036	1031	1035	1029	1022
21	1008	1014	1016	1008	1017	1021	1040	1035	1031	1046	1051	1037	1031	1026	1030	1020	1008
22	996	1004	1010	997	1005	1012	1033	1026	1016	1037	1043	1031	1025	1018	1024	1008	996
23	980	992	1003	987	992	1003	1024	1016	1007	1025	1038	1024	1017	1011	1017	996	980
24	965	982	995	975	980	994	1017	1005	997	1015	1033	1017	1008	1004	1010	982	965
25	954	969	986	964	970	984	1010	994	986	1004	1029	1008	998	995	1002	969	954
26	946	956	976	955	958	973	1001	982	974	994	1022	998	987	984	994	957	946
27	935	942	964	947	945	961	990	970	960	984	1012	989	976	972	984	947	935
28	919	930	952	937	932	948	977	960	946	974	1001	976	964	961	974	936	919
29	904	917	938	922	919	937	963	947	932	962	991	961	950	951	962	922	904

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30	889	905	922	906	907	924	951	935	918	949	979	946	935	939	950	908	889
31	874	892	906	892	893	910	939	924	904	934	968	931	919	925	940	894	874
32	858	879	893	876	880	894	926	910	890	920	955	919	904	909	926	880	858
33	841	864	883	862	868	879	912	896	873	907	940	906	888	893	910	865	841
34	824	849	868	848	854	863	896	879	857	893	924	892	873	876	893	851	824
35	808	833	851	832	838	847	879	862	843	880	907	876	859	860	877	836	808
36	794	817	834	817	823	831	863	847	830	866	893	859	843	845	860	820	794
37	780	802	816	803	810	814	846	834	815	851	876	844	830	832	844	804	780
38	765	788	799	786	797	796	829	820	800	838	855	832	815	817	828	791	765
39	751	775	781	769	783	783	811	806	785	826	834	819	802	802	812	778	751
40	736	762	763	753	768	771	792	790	770	813	816	804	790	787	794	764	736
41	720	746	746	741	752	760	774	778	755	797	798	792	778	771	773	750	720
42	704	731	727	726	735	745	756	765	737	782	779	779	766	757	752	737	704
43	686	716	709	710	717	726	737	750	718	768	764	764	754	743	734	722	686
44	671	700	690	694	699	707	719	734	704	751	750	748	738	729	717	706	671
45	657	683	673	677	678	691	701	715	690	735	735	730	719	714	700	689	657
46	643	667	659	656	659	673	683	698	673	720	717	713	697	697	682	673	643
47	628	653	645	633	640	650	665	682	658	704	699	693	671	677	662	657	628
48	611	637	628	611	618	629	651	664	644	687	682	674	646	659	646	641	611
49	594	617	611	592	595	609	638	644	627	669	666	649	624	635	630	626	594
50	574	598	594	575	568	588	622	627	609	650	652	622	603	609	612	609	574
51	557	580	577	551	541	568	600	611	594	634	635	594	582	584	595	592	557
52	541	564	558	525	517	544	576	593	578	617	615	572	562	564	578	575	541
53	525	547	538	501	497	516	558	574	561	592	596	552	539	543	562	556	525
54	510	526	517	480	465	490	538	555	549	568	581	531	515	520	546	535	510
55	495	506	499	461	417	466	517	537	536	547	559	505	492	498	529	518	495
56	479	486	475	422	396	445	492	520	521	530	533	484	442	473	509	501	479
57	462	467	449	381	372	396	472	501	505	515	502	454	423	446	487	484	462
58	442	448	425	360	354	367	453	481	482	495	474	405	407	416	462	464	442
59	420	429	401	337	309	347	426	459	460	479	450	386	385	382	437	442	420
60	398	407	375	319	273	325	402	437	434	458	423	368	345	363	413	421	398
61	380	384	354	268	255	296	378	418	412	436	404	347	290	342	390	401	380

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62	362	366	330	243	238	249	356	391	390	414	382	295	276	321	370	378	362
63	340	345	288	225	190	233	333	364	366	384	355	262	259	263	348	355	340
64	307	320	264	209	169	216	295	339	323	358	310	249	213	242	323	336	307
65	276	299	247	160	152	176	265	310	301	341	290	229	176	226	298	314	276
66	255	261	227	143	115	147	245	274	270	294	270	171	167	193	263	273	255
67	217	235	184	126	99	135	223	252	240	273	250	157	131	154	242	246	217
68	198	210	160	91	85	97	180	216	216	244	195	143	102	140	219	222	198
69	166	178	145	80	50	86	157	197	184	211	179	95	94	110	185	189	166
70	149	158	114	49	41	64	138	164	157	188	161	90	53	86	155	170	149
71	121	130	91	39	15	43	98	144	134	148	120	53	47	70	132	141	121
72	97	105	74	15	10	24	81	115	105	125	98	43	14	40	96	116	97
73	77	84	49	9	9	12	61	91	81	104	76	13	10	27	76	96	77
74	58	65	36	8	8	10	41	69	60	82	53	11	8	9	56	73	58
75	39	41	20	7	6	8	27	48	39	54	33	8	7	7	36	53	39
76	23	27	9	6	5	7	17	28	20	38	22	7	6	6	22	36	23
77	8	14	6	5	5	6	8	15	8	22	9	6	5	5	13	21	8
78	5	6	5	4	4	5	7	6	6	11	7	5	4	4	5	7	5
79	4	4	4	4	3	4	5	5	5	7	6	4	4	4	4	4	4
80	3	3	3	3	2	3	5	4	4	5	5	3	3	3	3	3	3
81	2	3	3	2	2	2	4	4	3	4	4	3	3	2	3	2	2
82	2	2	2	2	1	2	3	3	2	3	3	2	2	2	2	2	2
83	1	2	1	1	1	1	2	2	1	2	2	2	2	2	2	2	1
84	1	1	1	1	0	1	1	1	1	1	2	1	1	1	1	1	1
85	0	1	1	0	0	0	0	1	0	1	1	0	1	1	1	1	0
86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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137	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
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140	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	1	0
141	0	1	0	0	0	1	0	1	1	1	0	1	0	1	0	1	0
142	0	1	0	0	1	1	0	1	1	1	0	1	0	1	0	1	0
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145	0	1	1	0	1	1	0	1	1	1	0	1	0	1	0	1	0
146	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1
147	0	1	1	0	1	1	1	1	1	1	1	1	0	0	0	1	0
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149	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1
150	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1
151	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1
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155	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
156	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
157	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1

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158	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
159	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
160	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
161	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
162	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
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168	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
169	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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176	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
177	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
178	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
179	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

2.2 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)
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IES LM-79 2008

Test date	2015-12-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CSFL-30(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	0.2551	30.25	0.9883	10.63
4NB-B2	277.0	60	0.1230	30.96	0.9088	13.71

Sphere-Spectroradiometer Method:

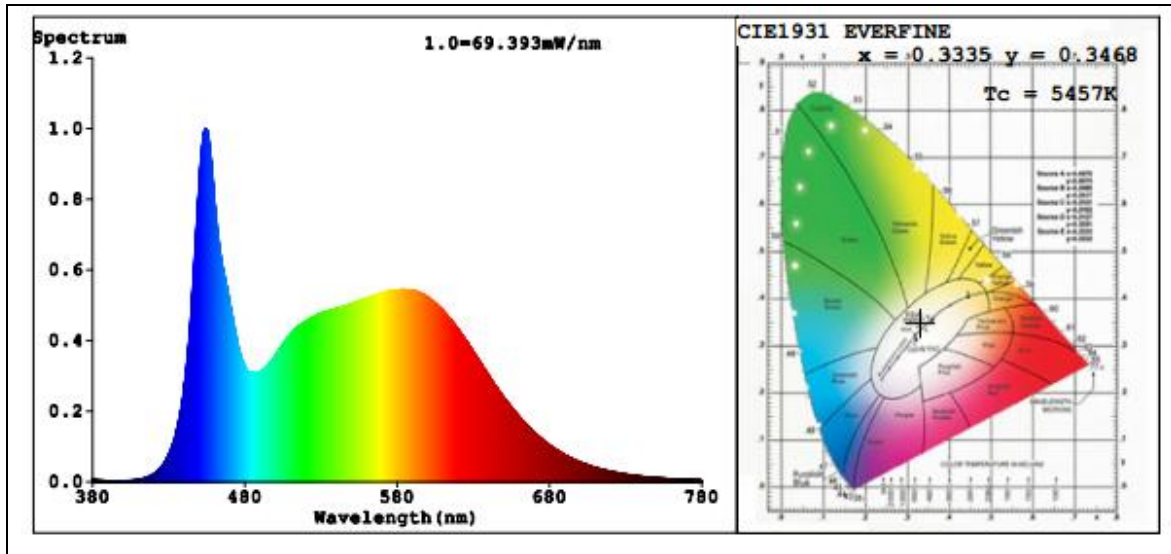
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	85.3
R9	15
CCT (K)	5457
Chromaticity (x, y)	x=0.3335 y=0.3468
Chromaticity (u', v')	u'=0.2054 v'=0.4806
Duv	0.0024
Total Initial Lumen Output(lm)	2836
Initial Lumen Efficacy(lm/w)	93.75

Special Color Rendering Indices			
R1	84	R9	15
R2	93	R10	83
R3	95	R11	82
R4	82	R12	63
R5	84	R13	88
R6	89	R14	98
R7	86	R15	79
R8	68	--	--

Sphere-Spectroradiometer Method for 277V:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Initial Lumen Output(lm)	2801
Initial Lumen Efficacy(lm/w)	90.46

Spectral Power Distribution & Chromaticity Diagram



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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2015-07-01	2016-06-30
ST-R-331	Spectral analysis system HAAS-2000	2015-07-01	2016-06-30
D204	Standard Lamp	2015-07-01	2016-06-30
PF2010	Power Meter for Integrating Sphere	2015-07-01	2016-06-30
EE-09	Goniophotometer system	2015-07-01	2016-06-30
D908S	Standard Lamp	2015-07-01	2016-06-30
PF210	Power Meter for Goniophotometer	2015-07-01	2016-06-30
ST-R-181A	Temperature Tester	2015-07-01	2016-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

******* END OF DATASHEET PACKAGE *******